Transportation Asset Management Council
Bridge Committee Meeting Agenda
Thursday, March 21, 2019 2:00 PM
Aeronautics Building- 2nd Floor Commission Room
2700 Port Lansing Road
Lansing, Michigan

Meeting Telephone Conference Line: 1-877-336-1828   Access Code: 8553654#

1. **Welcome - Call to Order – Introduction**

2. **Public Comments on Non-Agenda Items**

3. **Additions or Deletions of Agenda Items**

4. **Consent Agenda** *(Action Item)*
   4.1. Approval of the 2-21-19 Meeting Minutes *(Attachment 1)*

5. **Update Items**
   5.1. 2018 Michigan Roads and Bridges Annual Report
      5.1.1. Bridge Condition Reporting – *Curtis* *(Attachment 2)*
      5.1.2. 2018 Culvert Pilot Write-up – *Belknap* *(Attachment 3)*
   5.2. TAMC Culvert Pilot Project
      5.2.1. Continuing Culvert Data Collection Efforts into Future
      5.2.2. Culvert Data on TAMC Dashboards/Interactive Map – *Belknap (Attachment 4)*

6. **Public Comments**

7. **Member Comments**

8. *Adjournment:*

Next meeting is scheduled for April 25, 2019 @ 2:00 PM Aeronautics Building
2nd Floor Commission Room, 2700 Port Lansing Road, Lansing, Michigan

Committee Members: Chair: Rebecca Curtis, MDOT - Vice Chair: Keith Cooper, MDOT
Christopher Bolt, MAC - Al Halbeisen, ACEC - Wayne Harrall, CRA
Brian Vilmont, Subject Matter Expert - Brad Wieferich, MDOT

MINUTES
TRANSPORTATION ASSET MANAGEMENT COUNCIL
BRIDGE COMMITTEE MEETING
February 21, 2019 at 2:00 p.m.
Aeronautics Building, 2nd Floor, Commission Conference Room
2700 Port Lansing Road
Lansing, Michigan

** Frequently Used Acronyms List attached.

<u>**Committee Member:**</u>
Keith Cooper, MDOT – Vice-Chair   Rebecca Curtis, MDOT – Chair
Bill McEntee, CRA, via Telephone   Al Halbeisen, OHM Advisors
Brian Vilmont, Prein & Newhof   Brad Wieferich, MDOT

<u>**Support Staff:**</u>
Roger Belknap, MDOT, via Telephone   Wayne Harrall, KCRC, via Telephone
Dave Jennett, MDOT   Gloria Strong, MDOT

<u>**Members Absent:**</u>
Gary Mekjian, MML

<u>**Public Present:**</u>
Christopher Bolt, MAC/JCDOT, via Telephone

1. Welcome - Call-To-Order - Introductions:
The meeting was called-to-order at 2:04 p.m; everyone present was introduced.

2. Public Comments on Non-Agenda Items:
None

3. Additions or Deletions of Agenda Items:
None

4. Consent Agenda (Action Item):
4.1. - Approval of the January 21, 2019 Meeting Minutes (Attachment 1)

Motion: B. Vilmont made a motion to approve the January 21, 2019 meeting minutes; A. Halbeisen seconded the motion. The motion was approved by all members present.

5. Update Items:
   5.1. –TAMC Spring Conference Update – G. Strong (Attachment 2)
   The American Public Works Association (APWA) Conference will be held on May 22 and 23, 2019, at the Treetop Resort in Gaylord, Michigan. The APWA annual golf outing and reception is on May 21, 2019. The TAMC conference will be held in conjunction with APWA (sharing presenters) on Wednesday, May 22, 2019. The actual conference will be held at the Treetops Resort and lodging will be provided at the Otsego Resort due to the lack of lodging at Treetops Resort. A few presenters have confirmed

their attendance. Berrien County Road Department would like to present their asset management plan at the conference.

5.1.1. – TAMC Bridge Presentations – R. Belknap
The TAMC Bridge Committee will be presenting the bridge data and information on bridge bundling at the conference. The actual presenters have not been decided.

In the morning session Berrien county road commission may be doing a presentation on their asset management plan and process The Culvert Pilot Project update presentation will be done in the afternoon session.

5.2. – County Road Association Request – R. Belknap (Attachment 3)
The County Road Association (CRA) put in a formal request yesterday for PASER data. A copy of their letter was shared with the committee. MiBridge has not received a request from CRA. A spreadsheet was provided to Denise Donahue at CRA of all local inventory. It is assumed that CRA will send this spreadsheet out to all the county road agencies.

5.3. - 2018 Michigan Roads and Bridges Annual Report Schedule
5.3.1. – Bridge Condition Reporting – R. Curtis
R. Curtis went over draft bridge data documents and graphs that she created to be included in the annual report. The drafts do not include closed bridges. This year the number of poor bridges is not drastically increasing but the number of good and fair for bridges is going down. There has not been very much of an increase in funding last year. It was requested that the committee members review the annual report that she will send via email in the near future and provide comments back to her within two weeks. Non-NBI bridges will not be discussed in the annual report.

B. McEntee shared graphs of the 2017 Reported Bridge Projects by Improvement Type, by Investment by Improvement Type, Agency Type by Improvement Type, Investment by Agency Type, NHS vs. Non-NHS by Improvement Type, and NHS vs. non-NHS by Investment. The committee requested narrative be added to some of the graphs to better explain the data results.

R. Curtis would like a list of the 13 bridge projects to see if it is by letting or obligation. D. Jennett stated that it is by obligation for FY 2017 and he will send the list to her.

Action Item: It was requested that the Bridge Committee review the information that R. Curtis has drafted and provide any comments directly to her within two weeks after receipt.

Action Item: B. McEntee will place narrative on some of the graphs to better explain the data results.

Action Item: D. Jennett will provide the list of 13 bridge projects to R. Curtis.

5.3.2. – 2017 Investment Reporting for Bridges – R. Belknap (Attachment 5)
See above in 5.3.1.

5.4. – TAMC Culvert Pilot Project
5.4.1. – Status of Invoices and Project Budget Update – R. Belknap

R. Belknap is working with MDOT Finance to determine how much of the Culvert Pilot Project money is left over after the pilot was completed. These funds are not MTF funds. After it is determined how much money remains, the Bridge Committee will be tasked with deciding how to spend the remaining funds. Finance feels that there is approximately $680,000 remaining from the Culvert Pilot Project. For FY 2019 and FY 2020 approximately $15,000 each year will go towards MTU Webinar trainings and continue culvert data collection. In FY 2019, CSS will take the pilot data and do dashboards and populate the interactive maps with the information.

The committee would like the same general data sets shared to all agencies submitting culvert data. MTU will contact the Department of Natural Resources (DNR) to find out what data sets they will share if the TAMC Bridge Committee wants this data merged into our culvert pilot project. CSS will also need this information.

CSS is ready to do the culvert dashboards and maps but they are waiting on the Bridge Committee to make key decisions. They do not have access to the culvert data. B. McEntee has some data graphs ready to go for the culverts. The data is listed by material type, diameter span, and condition type. The committee would like the dashboards split out by size ranges – 0 to23 (less than 24); 24 to 47 (less than 48), and 48 to less than 10.

R. Belknap would like to hold a conference call to discuss this matter further with CSS, MTU, and some bridge committee members.

Action Item: MTU will contact DNR to find out what data sets they will share with TAMC.

5.4.2. – Future Culvert Data Collection Efforts – R. Curtis
See above at 5.4.1. The TAMC Bridge Committee will be looking at ideas on how to use the remaining funds from the Culvert Pilot Project. Further discussions will be had.

6. Public Comments:
None

7. Member Comments:
None

8. Adjournment:
A motion was made by R. Curtis to adjourn the meeting; A. Halbeisen seconded the motion. The motion was approved by all members present. The meeting adjourned at 3:38 p.m. The next meeting will be held March 21, 2019, at 2:00 p.m., MDOT Aeronautics Building, 2nd Floor Commission Conference Room, Lansing.

TAMC FREQUENTLY USED ACRONYMS:

AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
ACE	ADMINISTRATION, COMMUNICATION, AND EDUCATION (TAMC COMMITTEE)
ACT-51	PUBLIC ACT 51 OF 1951-DEFINITION: A CLASSIFICATION SYTEM DESIGNED TO DISTRIBUTE MICHIGAN'S ACT 51 FUNDS. A ROADWAY MUST BE CLASSIFIED ON THE ACT 51 LIST TO RECEIVE STATE MONEY.
ADA	ADULTS WITH DISABILITIES ACT
ADARS	ACT 51 DISTRIBUTION AND REPORTING SYSTEM
BTP	BUREAU OF TRANSPORTATION PLANNING (MDOT)
CFM	COUNCIL ON FUTURE MOBILITY
CPM	CAPITAL PREVENTATIVE MAINTENANCE
CRA	COUNTY ROAD ASSOCIATION (OF MICHIGAN)
CSD	CONTRACT SERVICES DIVISION (MDOT)
CSS	CENTER FOR SHARED SOLUTIONS
DI	DISTRESS INDEX
ESC	EXTENDED SERVICE LIFE
FAST	FIXING AMERICA'S SURFACE TRANSPORTATION ACT
FHWA	FEDERAL HIGHWAY ADMINISTRATION
FOD	FINANCIAL OPERATIONS DIVISION (MDOT)
FY	FISCAL YEAR
GLS REGION V	GENESEE-LAPEER-SHIAWASSEE REGION V PLANNING AND DEVELOPMENT COMMISSION
GVMC	GRAND VALLEY METRO COUNCIL
HPMS	HIGHWAY PERFORMANCE MONITORING SYSTEM
IBR	INVENTORY BASED RATING
IRI	INTERNATIONAL ROUGHNESS INDEX
IRT	INVESTMENT REPORTING TOOL
KATS	KALAMAZOO AREA TRANSPORTATION STUDY
KCRC	KENT COUNTY ROAD COMMISSION

LDC	LAPTOP DATA COLLECTORS
LTAP	LOCAL TECHNICAL ASSISTANCE PROGRAM
MAC	MICHIGAN ASSOCIATION OF COUNTIES
MAP-21	MOVING AHEAD FOR PROGRESS IN THE 21ST CENTURY (ACT)
MAR	MICHIGAN ASSOCIATION OF REGIONS
MDOT	MICHIGAN DEPARTMENT OF TRANSPORTATION
MDTMB	MICHIGAN DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
MIC	MICHIGAN INFRASTRUCTURE COMMISSION
MITA	MICHIGAN INFRASTRUCTURE AND TRANSPORTATION ASSOCIATION
MML	MICHIGAN MUNICIPAL LEAGUE
MPO	METROPOLITAN PLANNING ORGANIZATION
MTA	MICHIGAN TOWNSHIPS ASSOCIATION
MTF	MICHIGAN TRANSPORTATION FUNDS
MTPA	MICHIGAN TRANSPORTATION PLANNING ASSOCIATION
MTU	MICHIGAN TECHNOLOGICAL UNIVERSITY
NBI	NATIONAL BRIDGE INVENTORY
NBIS	NATIONAL BRIDGE INSPECTION STANDARDS
NFA	NON-FEDERAL AID
NFC	NATIONAL FUNCTIONAL CLASSIFICATION
NHS	NATIONAL HIGHWAY SYSTEM
PASER	PAVEMENT SURFACE EVALUATION AND RATING
PNFA	PAVED NON-FEDERAL AID
PWA	PUBLIC WORKS ASSOCIATION
QA/QC	QUALITY ASSURANCE/QUALITY CONTROL
RBI	ROAD BASED INVENTORY
RCKC	ROAD COMMISSION OF KALAMAZOO COUNTY
ROW	RIGHT-OF-WAY

RPA	REGIONAL PLANNING AGENCY
RPO	REGIONAL PLANNING ORGANIZATION
SEMCOG	SOUTHEAST MICHIGAN COUNCIL OF GOVERNMENTS
STC	STATE TRANSPORTATION COMMISSION
STP	STATE TRANSPORTATION PROGRAM
TAMC	TRANSPORTATION ASSET MANAGEMENT COUNCIL
TAMCSD	TRANSPORTATION ASSET MANAGEMENT COUNCIL SUPPORT DIVISION
TAMP	TRANSPORTATION ASSET MANAGEMENT PLAN
TPM	TRANSPORTATION PERFORMANCE MEASURES
UWP	UNIFIED WORK PROGRAM

S:/GLORIASTRONG/TAMC FREQUENTLY USED ACRONYMS.11.27.2018.GMS

INTRODUCTION
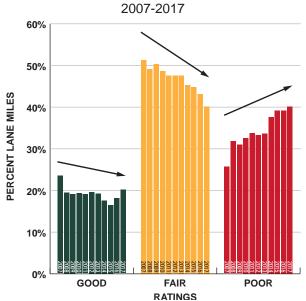
2017 was a very active year, from collection of Road and Bridge conditions to new efforts tied to the Michigan Infrastructure Asset Management Pilot Program, as well as pilots for asset management plan development, and upgrades to many services such as the Investment Reporting Tool and interactive map.

Major takeaways from 2017:

- **Roads** – Poor pavements continue to increase. The number of miles of Federal Aid Roads in poor condition is now equal to the number of miles in fair condition. *(See 2017 Road Condition)*

- **Bridges** – More than twice as many bridges declined in condition compared to those that were improved. *(See 2017 Bridge Condition)*

Encouraging news:

- **Investment Data** – The first full year of investment data is now available to assist in future data-driven decision-making. *(See Investment Reporting)*

- **Pilot Programs** – New tools and classes are being created to develop asset management plans and expand asset inventory collection efforts *(See TAMC 2017 Year in Review)*
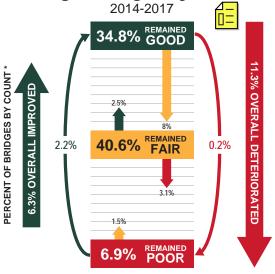
Paved Federal-Aid Road Condition
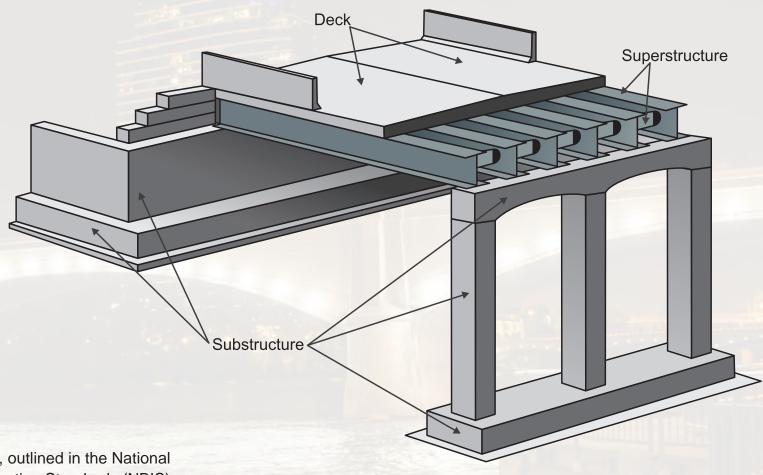
2007-2017

Michigan Bridges Cycle of Life

2014-2017

PERCENT OF BRIDGES BY COUNT *

6.3% OVERALL IMPROVED

11.3% OVERALL DETERIORATED

34.8% REMAINED GOOD

2.5%

8%

2.2%

40.6% REMAINED FAIR

0.2%

3.1%

1.5%

6.9% REMAINED POOR

* Does not include bridges added or removed in this time period

2017 BRIDGE CONDITION

Deck

Superstructure

Substructure

Federal law, outlined in the National Bridge Inspection Standards (NBIS), defines a bridge as a structure carrying traffic with a span greater than 20 feet and requires that all bridges be inspected every two years to monitor and report condition ratings. The FHWA requires that for each applicable bridge, the performance measures for determining condition be based on the minimum values for substructure, superstructure, deck, and culverts. The FHWA further requires counting this condition by the respective deck area of each bridge and expressing condition totals as a percentage of the total deck area of bridges in a state.

Condition ratings are based on a 0-9 scale and assigned for each culvert, or the deck, superstructure and substructure of each bridge. These ratings are recorded in the National Bridge Inventory (NBI) database. Condition ratings are an important tool for transportation asset management, as they are used to identify preventative maintenance needs, and to determine rehabilitation and replacement projects that require funding.

An analysis of bridge conditions in Michigan shows that bridge-owning agencies and decision makers are continuing to "hold their own" despite rising costs and revenue challenges. From 2004 to 2017, the network of bridges in the state saw a slight but steady improvement in overall condition.

However, from 2011 to 2017 the improvement in bridge condition has stagnated with a slight decline in 2017, and the current forecast shows a gradual decline as the forecast approaches the year 2027. This can be attributed to:

1. Progress being made initially in reducing the number of structurally deficient bridges in the state.

2. More bridge owning agencies are implementing preventive maintenance "mix of fixes" strategies on bridges that they own.

3. Rising costs and an increasing inventory of fair bridges creates a preservation need that exceeds available funding.

The percentage of Michigan's bridges which are rated structurally deficient is one of the state's measures of the overall strength of Michigan's economy, and this measure can be accessed here: *https://future.michigan.gov/stat/goals/ pm2b-qqpn/2yeu-g8wn/97mf-mai3*

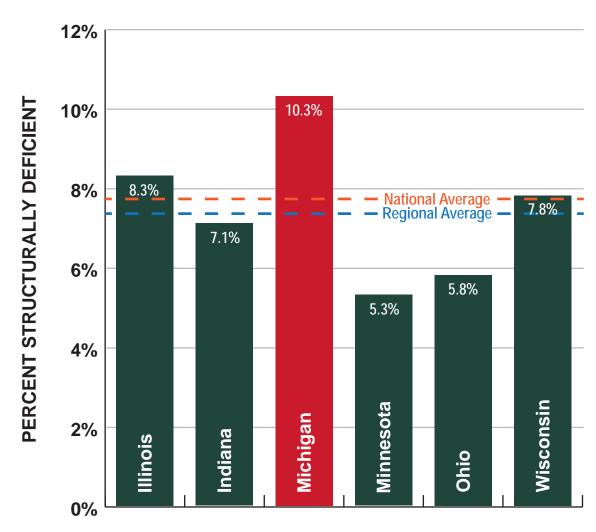| NBI Condition Ratings			
7-9	Good Condition		Routine maintenance candidate.
5-6	Fair Condition		Preventative maintenance and minor rehabilitation candidate.
4	Poor Condition	Poor	Major rehabilitation or replacement candidate.
2-3		Serious or Critical	Emergency repair or high priority major rehabilitation or replacement candidate. Unless closely monitored it may be necessary to close until corrective action can be taken.
0-1		Imminent Failure or Failed	Major rehabilitation or replacement candidate. Bridge is closed to traffic.

Comparing Michigan's progress toward reducing poor bridges with the rest of the nation and with our neighboring states highlights the need for continued concern regarding Michigan's ability to preserve its strategic bridge assets. Figure 10 indicates that Michigan has a significantly higher percentage of poor bridges than other Great-Lakes states. An analysis of the 2018 NBI data shows that 4.9 percent of MDOT bridges and 13.7 percent of county, city and village bridges were structurally deficient, resulting in Michigan having 10.3 percent of all highway bridges structurally deficient.

2017 Percent Poor Bridges
All Highway Bridges (Great Lakes States)

Figure 10
Source: MDOT March 2018

2010-2017 Bridge Condition
All Roadway Bridges (MDOT and Local Agency)

PERCENT OF BRIDGES

50%

40%

30%

20%

10%

0%

GOOD · 2010 2011 2012 2013 2014 2015 2016 2017

FAIR · 2010 2011 2012 2013 2014 2015 2016 2017

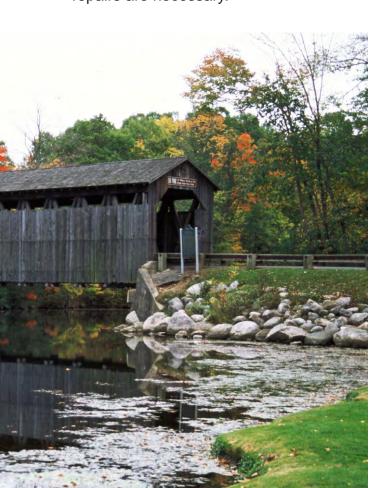POOR · 2010 2011 2012 2013 2014 2015 2016 2017

RATINGS
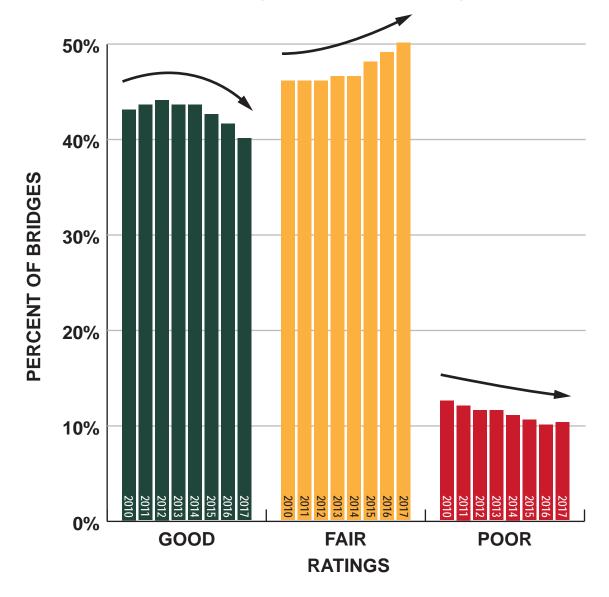
Figure 11
Source: MDOT 2010-17 Michigan Bridge Inventory

Figure 11 summarizes the percentage of Michigan bridges in good, fair, and poor condition for the years 2010-2017. ==Michigan bridge owners and decision makers have reduced the percentage of bridges in poor condition while increasing the number of bridges in good or fair condition. Although the trend-line for the poor category is decreasing, there is some concern that the trend for the good category is also decreasing at an increasing rate.== Without continued implementation of effective preventive maintenance strategies and additional funding directed toward bridge maintenance, those fair to poor border-line bridges are in danger of dropping into the poor category.

Figure 12 shows that local bridge owners have maintained the number of poor bridges with progress only starting to reverse in 2018. The number of good bridges has decreased, and the number of fair bridges has increased. It is important that bridge-owning agencies apply strategic preventive maintenance strategies to maintain or reduce the number of bridges in fair condition (NBI Ratings of 5 or 6) to prevent them from dropping into the poor category (NBI Rating <5) where more expensive repairs are necessary.

2014-2017 Local Bridge Condition Trend
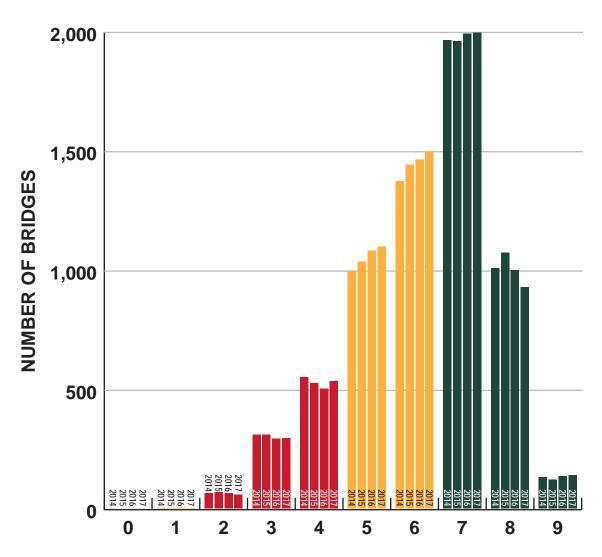
Figure 12
Source: MDOT, 2014-2017 Michigan Bridge Inventory

2014-2017 Trunkline Bridge Condition Trend
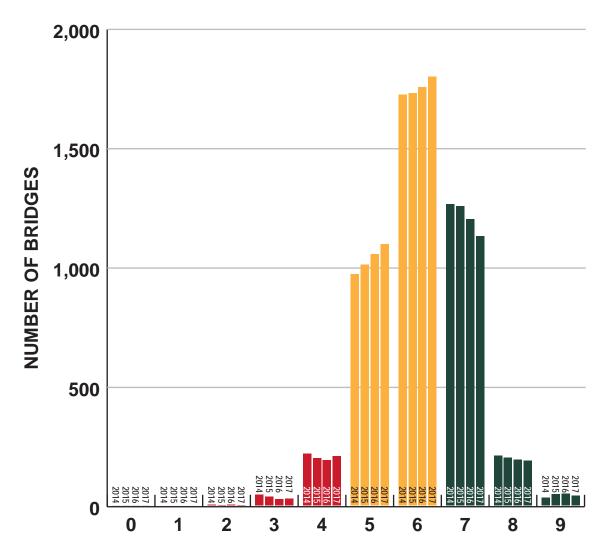

NUMBER OF BRIDGES

Figure 13
Source: MDOT, 2014-17 Michigan Bridge Inventory

Figure 13 shows that the MDOT's progress in reducing the number of poor bridges on state-owned roads has also slowed over the last four years. Until recently, MDOT has been able to maintain the number of fair bridges before they reach the poor category, while increasing the number of good and fair bridges. An aging infrastructure and rising costs have reversed some of that progress. The number of fair bridges has increased and in 2018 the number of poor bridges increased slightly as preservation needs exceed available revenues. Maintaining or improving the bridges rated in good or fair condition is imperative to prevent the number of bridges in the poor category from increasing further.

Bridge Condition Forecast

Working from current bridge condition information (NBI Data), bridge deterioration rate, project costs, expected inflation, and fix strategies, the Bridge Condition Forecasting System (BCFS) estimates future condition of bridges. Figure 14 indicates the combined overall bridge condition of all the state's bridges is expected to ==continue to decline== after 2017. By ==2028==, nearly ==all== of the progress made toward improving bridge condition since 2004 could be lost.

While additional highway funding was approved at both the state and federal level, no new funds were earmarked specifically for local bridge programs. Therefore, this forecast assumes no additional spending on bridges beyond those funds already designated for that purpose.

2018-2027 Bridge Condition Forecast
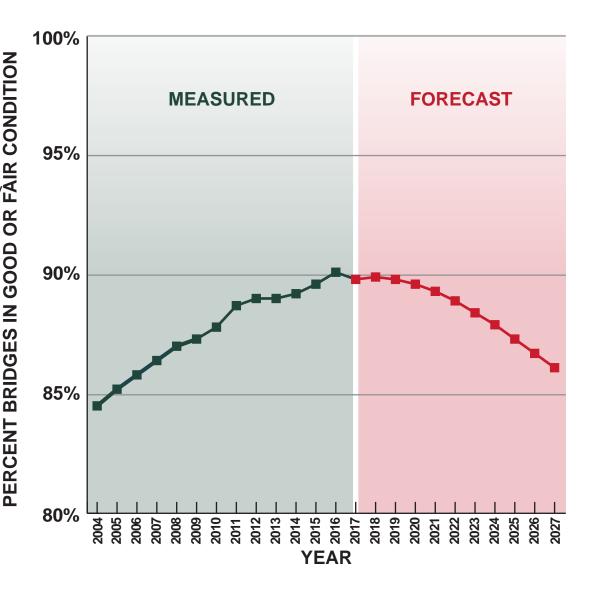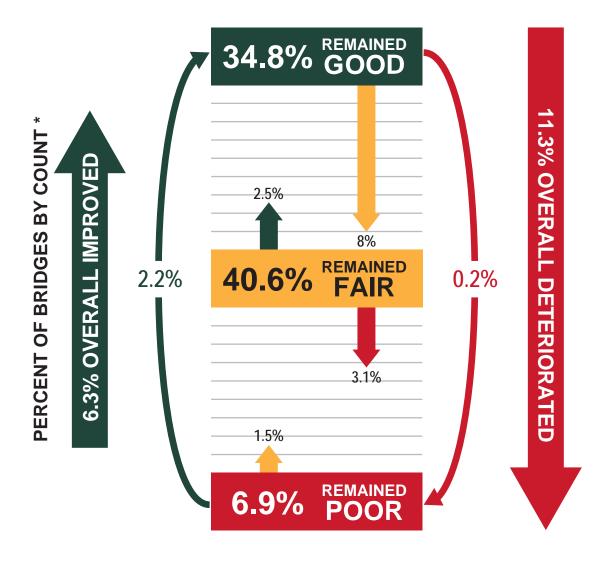### All Roadway Bridges (MDOT and Local Agency)

Figure 14
Source: MDOT March 2018

Michigan Bridges Cycle of Life

2014-2017

PERCENT OF BRIDGES BY COUNT *

6.3% OVERALL IMPROVED

11.3% OVERALL DETERIORATED

34.8% REMAINED GOOD

2.5%

8%

2.2%

40.6% REMAINED FAIR

0.2%

3.1%

1.5%

6.9% REMAINED POOR

Does not include bridges added or removed in this time period

Figure 15
Source: MDOT March 2018

Bridge Cycle of Life

Bridges, similar to roads, deteriorate through a cycle of life starting from good condition, to fair and ultimately to poor. There are many places where performing some Capital Preventive Maintenance (CPM) at a lower cost compared to a reconstruction or deck replacement can prolong the life of a bridge for many years.

Figure 15 shows the percentage of bridges that have improved or deteriorated into each of the major condition categories over the last four years (2014 – 2018). Michigan's overall goal is to reduce the number of poor bridges, but unfortunately over this time span, 12.3 percent of Michigan's bridges have worsened while only 5.7 percent of the bridges were improved.

Bridge Projects Details

Bridge projects are reported based on 5 project work types. The work types are 1) CPM, 2) Scheduled Maintenance, 3) Structural Improvement, 4) Rehabilitation, 5) Replacement. The following table presents the number bridge projects and level of investment by the 5 work types.

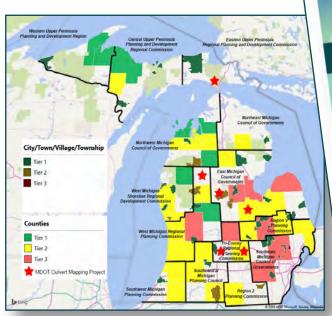| 2016 Bridge Projects Details		
Type of Projects	**Count**	**Cost**
Capital Preventive Maintenance	100	$26,204,893
Scheduled Maintenance	28	$7,687,249
Rehabilitation	68	$46,060,926
Replacement	91	$224,198,731
Structural Improvement	7	$25,186,536
Total Number of Bridge Projects:	**294**	**$329,338,335**

Culvert Pilot Project

The Michigan Legislature provided two million dollars to the TAMC for a pilot effort to inventory and inspect cross road culverts. Some of the planned outcomes are to develop a rating system, provide training, estimate the amount of effort and cost to implement more broadly, with a summary report due in the Fall of 2018. In response to a survey conducted by the TAMC as part of the project, a number of agencies indicated a willingness to participate, as shown on the map below.

Joint Conference

For its 2018 Spring Conference, TAMC has coordinated its efforts with the Michigan Chapter of the American Public Works Association (APWA). The two groups will be hosting conferences co-located at the Grand Traverse Resort. TAMC welcomes the opportunity to partner with APWA to share information about asset management efforts with a broader audience.

Transparency and Collaboration

TAMC plans to share information on road and bridge projects from the IRT with the public via the Interactive Map. This change will help further collaboration, transparency and public awareness. This will also provide additional opportunities to coordinate improvements to infrastructure assets that share the road right-of-way.

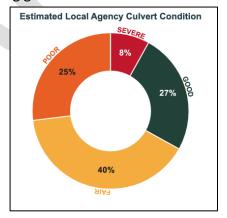**Annual Report Section: 2018 TAMC Local Agency Culvert Pilot Mapping Project**

In 2018, the TAMC tasked its Bridge Committee with managing a work plan for a pilot project for the collection of data and the evaluation of culverts owned by local transportation agencies within Michigan. The work was funded though House Bill 4320 (S-3) - Supplemental Appropriation Adjustments, which added $2 million to the fiscal year 2018 budget from the state restricted Michigan Infrastructure Fund.
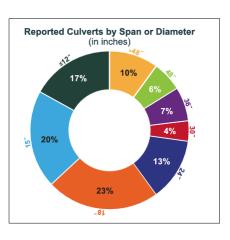
TAMC reached out to the Center for Technology and Training (CTT) at Michigan Technological University to assist with managing and facilitating the project. Based on the budget established by the TAMC Bridge Committee, the CTT assembled a work program to guide the project from information gathering to final reporting. Drawing from information gathered during the literature review, CTT staff developed recommendations for data collection procedures, data elements to collect, equipment recommendations for field data collection, assessment methods for evaluating the condition of culverts, and the necessary field log forms for tracking the effort needed to complete the work. The CTT then established a training program for guidance on the data collection operation.

Project Goals

The intent of the culvert data collection pilot project was to collect data on Public Act 51 Certified Roads in Michigan at a statewide level for the following goals:

1. Estimate the total number of culverts in the state: *CTT calculated the estimated number of statewide local agency culverts to be between 178,939 and 213,649.*

2. Estimate the overall condition of culverts in the state using similar inspection components and rating:
   a. *27% were rated "Good"*
   b. *40% were rated as "Fair"*
   c. *25% were rated as "Poor"*
   d. *8% were rate as "Critical"*

Estimated Local Agency Culvert Condition

3. Determine the range of physical characteristics (inventory information) of culverts, such as material, size, and depth, that may impact the cost to maintain or replace the asset.
   a. *69% were corrugated steel pipe*
   b. *21% were concrete*
   c. *5% were plastic*
   d. *A majority of reported culverts—88%—were circular in shape*
   e. *90% were 48 inches or less in span*

4. Benchmark estimates of agency labor (time and materials) necessary to find and collect inventory

Reported Culverts by Span or Diameter (in inches)

data for culverts on a dollar per mile or other production rate basis: *the average culvert data collection labor cost is estimated to be $39.02 per mile for county road agencies and $69.17 per mile for cities and villages.*

Participants and Outcomes

The TAMC and CTT worked with forty-nine local agencies that successfully located nearly 50,000 culverts in the 13-week data collection window (April 30 – July 30). This is an impressive level of coordination and cooperation between the TAMC, CTT, and local agencies. Furthermore, as mentioned previously, TAMC and MDOT staff coordinated reimbursement to the local agencies through the existing Unified Work Program contracts with Michigan's Planning Regions and Metropolitan Planning Agencies. This increased the level of participation from TAMC, CTT, CSS and the 49 local agencies to include all 14 regional planning agencies and 2 metropolitan planning organizations. It is noteworthy to mention that the project included participants representing every planning region in Michigan. Therefore, information gathered in this pilot contains data from both urban and rural areas of the state as well as large road agencies and small villages.

Key Findings from Pilot

1. The tools, training, business processes, and relationship building that the TAMC initiated for the collection of Pavement Surface Evaluation and Rating (PASER) road condition data has created a strong framework for the rapid collection of other asset data on the local agency road system.

2. The repeating five-year costs associated with training and data collection for a culvert inventory and condition evaluation program are estimated at $10.5 million to $11.25 million ($2.1 million to $2.5 million annually). These estimates do not include costs associated with development and implementation of asset management programs for culverts.

3. A post-pilot survey showed participant interest in continuing to collect inventory and condition evaluation data on the culverts beyond the pilot timeframe.

4. Inventory data from culverts revealed that the majority (approximately 73 percent) of local agency-owned culverts are small (24 inches in diameter or less), made from corrugated steel, and are circular culverts that are located less than 6 feet from the surface. Larger and more deeply buried culverts are of specific interest because they present a larger consequence of failure in terms of risk to the public and expenditure of funds for repair.

5. Condition data indicates that the local agency-owned culverts are in serviceable shape, with 27 percent of the rated culverts holding condition ratings of 8 or better, and 67.2 percent of the rated culverts holding conditions of 6 or better.

6. It is estimated that it will take approximately $10 million and more than 131,000 collection team hours to complete the initial data collection of local agency culverts.

Conclusion

This pilot project revealed that the tools, business processes, and relationship building that the TAMC initiated for the collection of PASER road condition data has created a strong framework for the rapid collection of other asset data on the public road system. This is apparent from the significant capabilities that pilot participants demonstrated with their ability to collect a large volume of high-quality asset inventory and condition data in a little over three months. This data was assembled and analyzed using existing business processes and resources. The majority of local agencies used their own forces for collection of data which indicates a domestic capacity to complete this type of activity.
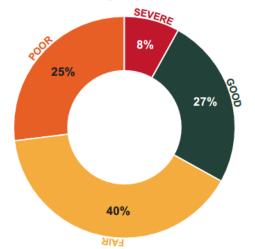
- 49 participating local road agencies
- 13-week data collection window
- 49,644 culverts inventoried
- 90% of local agencies reported using Roadsoft
- 73% of local agency culverts are 24 inches in span or less, 90% are less than 48 inches in span
- 85% are buried 6 feet or less
- 67.2% of rated local agency culverts were 6 or higher out of 10
- Estimated local agency culverts in state – 196,000
- Estimated cost for initial data collection - $10 million

Project Report

A final report of the pilot project was provided to the Michigan Legislature, Governor Rick Snyder and the Michigan Infrastructure Council on October 1, 2018. The report included background, methods, observations and recommendations for continuing the effort to collect, assess and manage culvert data into the future. The full report, summary and appendices are available on the "Support" page of the TAMC website: www.Michigan.gov/TAMC.

TAMC Culvert Pilot – Data Fields/Elements for TAMC Dashboards & Interactive Maps (DRAFT)

Estimated Local Agency Culvert Condition

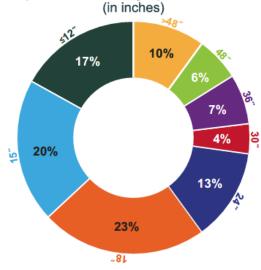| |
|---|
| Agency Name |
| Agency Type (County/City/Village) |
| Culvert ID |
| Location |
| Condition Rating (10 Scale Rating) |
| Summary of Rating (good/fair/poor/severe) |
| Others? |

Reported Culverts by Span or Diameter
(in inches)

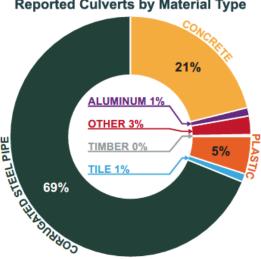| |
|---|
| Agency Name |
| Agency Type (County/City/Village) |
| Culvert ID |
| Location |
| Culvert Span or Diameter (in inches) |
| Summary of Size Categories (12" or less, 13"-15", 16"-18", 19"-24", etc) |
| Others? |

Reported Culverts by Material Type

Agency Name
Agency Type (County/City/Village)
Culvert ID
Location
Culvert Material Type
Others?